

REMARKS

The Examiner has not indicated whether the drawing filed with the application on March 5, 2002 has been accepted. Applicants respectfully request that the Examiner make such an acknowledgement.

In the present Amendment, the specification has been amended to correct two typographical errors. Specifically, in Table 1 at page 20, "Methyl t-butyl ether" in the rightmost column has been replaced with --Methyl s-butyl ether--. It is obvious to one skilled in the art that there is no methyl butyl ether, but methyl t-butyl ether and methyl s-butyl ether. Also, "Example 1" in the second line of the leftmost column has been replaced with --Example 2--. This amendment is supported by the specification at, for example, page 19, lines 22-24.

Claims 11-18 have been added as new claims. These new claims 11, 12-13 and 14-18 are supported by the specification at, for example, page 14, lines 16-17 and page 15, lines 20-23, page 7, lines 2-6, and page 8, lines 1-3, respectively.

Claims 9 and 10 have been cancelled.

No new matter has been added and thus, entry of the Amendment is respectfully submitted to be proper. Upon entry of the Amendment, claims 1-8 and 11-18 will be all the claims pending in the application.

On page 2 of the Office Action, claims 1-8 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Jackson et al (USP 5,670,702) and Purvis et al (USP 5,981,818) in view of EP 68,785.

Applicants respectfully traverse the rejection for the following reasons.

Jackson et al discloses a process for producing an (meth)-acrylate which comprises reacting, in liquid phase, a $C_{3 \text{ to } 6}$ alpha-olefin with oxygen and a lower alcohol in the presence of water and a heterogeneous bi-functional catalyst having both acidic functionality and catalytic metal functionality (column 1, lines 57-62). The $C_{3 \text{ to } 6}$ alpha-olefin may be isobutylene, and the lower alcohol may be methanol (column 4, lines 3-5). Isobutylene and methanol may be obtained by "back-cracking" methyl t-butyl ether (column 4, lines 7-8).

However, Jackson et al does not disclose or suggest that the methanol generated by decomposition of methyl t-butyl ether is recovered therefrom, and then used in an esterification step.

Purvis et al discloses that isobutylene may be catalytically oxidized to produce methacrolein, which is then oxidized to produce methacrylic acid. Methacrylic acid is esterified with methanol to produce methyl methacrylate (column 22, lines 51-60).

However, similar to Jackson et al, Purvis et al does not disclose or suggest the use of the recovered methanol generated by decomposition of methyl t-butyl ether in an esterification step.

EP '785 discloses a process for recovering isobutylene and methanol by decomposing methyl t-butyl ether (Abstract). Isobutylene can be used to produce methacrylic acid (page 1, lines 17-21). Methanol, which is one of the decomposition products of methyl t-butyl ether, is separated from the side cut effluent or the effluent after distillation of isobutylene, preferably by extraction with water (page 1, lines 2-7).

Similar to Jackson et al and Purvis et al, EP '785 does not disclose or suggest the use of the recovered methanol generated by decomposition of methyl t-butyl ether in an esterification step.

It was asserted that "[t]he EP specifically states the products are suitable for use in the preparation of methacrylic acid" (page 2, lines 12-14 of the Office Action). However, the product that is referred to in EP '785 as a raw material in the preparation of methacrylic acid is an isobutylene, rather than a methanol.

While EP '785 teaches that the methanol is generated in the decomposition of methyl t-butyl ether and may be recovered from the decomposition mixture, EP '785 does not disclose or suggest an esterification step using such a recovered methanol. The esterification with the recovered methanol as recited in step (iii) of the present invention is not known in and also not obvious over EP '785.

As described above, none of the cited references discloses or suggests that the methanol recovered from the decomposition of methyl t-butyl ether would be reused in an esterification step to produce methyl methacrylate.

Further, it has been known in the art that a methanol recovered from a production process other than that of methyl methacrylate has problems when reused in esterification for producing methyl methacrylate (page 2, lines 11-17 of Applicants' specification).

Accordingly, one skilled in the art would not have been motivated to reuse the methanol recovered from decomposition of methyl t-butyl ether in an esterification step to produce a methyl methacrylate.

Further, in the preferred embodiments, the esterification step of the presently claimed invention is conducted using the methanol which has been recovered from the decomposition of methyl t-butyl ether and which contains about 99 % by weight or more and more preferably 99.9 % by weight or more of methanol. The recovered methanol may contain about 10 ppm by weight or less of t-butyl alcohol and/or about 10 ppm by weight or less of methyl t-butyl ether (page 7, line 21 to page 8, line 3 of Applicants' specification).

Such a methanol has high purity, especially in terms of amounts of t-butyl alcohol and methyl t-butyl ether as recited above, and can be obtained in an easy way such as distillation. This results in the unexpected superior effects of the presently claimed invention.

Specifically, the presently claimed invention provides a process for producing methyl methacrylate with high purity and low cost. For example, as shown in Table 1 of Applicants' specification, methyl methacrylate obtained in the presently claimed invention is of the same high purity as that produced by using commercially available special grade methanol.

These results are not expected over the cited references, and therefore, the presently claimed invention is patentable over the references.

In view of the above, Applicants submit that a *prima facie* case of obviousness against the presently claimed process has not been established, and the presently claimed process is not obvious and is patentable over the cited references.

Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 10/087,858

On page 3 of the Office Action, claims 9 and 10 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Jackson et al and Purvis et al in view of EP '785.

Applicants respectfully submit that the rejection is moot, because in this Amendment, claims 9 and 10 have been cancelled. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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